



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/699,059

10/31/2003

Yudong Zhu

122233

2584

41838 7590 11/06/2008  
GENERAL ELECTRIC COMPANY (PCPI)  
C/O FLETCHER YODER  
P. O. BOX 692289  
HOUSTON, TX 77269-2289

EXAMINER

SMITH, RUTH S

ART UNIT

PAPER NUMBER

3737

MAIL DATE

DELIVERY MODE

11/06/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/699,059	<b>Applicant(s)</b> ZHU ET AL.	
	<b>Examiner</b> Ruth S. Smith	<b>Art Unit</b> 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

### ***Claim Objections***

Claims 14,16-20,23,24 are objected to because of the following informalities: In claim 14, it is unclear as to whether the phantom has been set forth as part of the claimed invention. The claim appears to set forth a step in a method of use rather than a structural limitation. In claims 16,18,24, it is unclear as to what further structural limitation has been set forth. Claims 16,24 merely set forth an additional function of the image reconstructor. In claims 17,19,20,23,24 “the intermittently received signals” lacks antecedent basis. In claim 18, it is unclear as to whether the use of a solid former is an optional element in the system. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 12,14-16,19,21-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Eggers et al (2003/0016015). Eggers et al disclose an MRI system that includes a coil array 6 and a controller configured to generate and update sensitivity maps based upon position data obtained from the coils. The coils include markers and the MRI system is used to detect the position of the coils and correct a reference sensitivity map based upon coil movement. The system can include a phantom 20 used to generate the reference maps. As disclosed in paragraph 0030, Eggers et al disclose that the position and orientation of the coils can be monitored at regular intervals. Therefore, the signals can be received in an interleaved manner.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3,5-11,20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eggers et al (2003/0016015) in view of Jakob et al (6,289,232) and Magnuson et al (5,592,083) or DeMeester et al (6,552,538). Eggers et al disclose an MRI system that includes a coil array 6 and a controller configured to generate and update sensitivity maps based upon position data obtained from the coils. The coils include markers and the MRI system can be used to detect the position of the coils and correct a reference sensitivity map based upon coil movement. The system can include a phantom 20 used to generate the reference maps. As disclosed in paragraph 0030, Eggers et al disclose that the position and orientation of the coils can be monitored at regular intervals. Therefore, the signals can be received in an interleaved manner. Eggers et al fail to disclose deriving actual sensitivity maps based in part on coil loading. Jakob et al disclose that actual sensitivity profiles of the coils are affected by coil loading. Magnuson et al and DeMeester et al each disclose an MRI system where coil loading is

measured. It would have been obvious to one skilled in the art to have modified Eggers et al such that the coil loading is measured and taken into account when providing the sensitivity maps for the coils. The advantage of such would be to ensure the accuracy of the sensitivity maps provided. Eggers et al further discloses that the reference sensitivity maps can be provided using mathematical formulas. Jakob et al disclose that one type of formula used to measure the reference maps is Biot-Savart's law. It would have been obvious to one skilled in the art to have modified Eggers et al such that the reference maps are determined using Biot-Savart's law. The selection of one of these known formulations to determine the sensitivity profile of the coil would yield predictable results to one skilled in the art at the time of the invention. With respect to claim 5, Eggers et al disclose that MR imaging can be used to determine the position and orientation of the coil. It would have been obvious to one skilled in the art to have used any known method for determining position information of the coil. The substitution of one known method for determining position information for another using MR data would yield predictable results to one skilled in the art at the time of the invention. With respect to claim 7, in the absence of any showing of criticality, the specific type of coil and marker used would have been an obvious design choice of known equivalents in the art.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eggers et al (2003/0016015) in view of Jakob et al (6,289,232) and Magnuson et al (5,592,083) or DeMeester et al (6,552,538) as applied to claim 1 above, and further in view of Lee (2001/0043068). Lee discloses the use of Maxwell's equations to determine the sensitivity profile of a receiver coil. It would have been obvious to one skilled in the art to have modified Eggers et al such that the reference maps are determined using Maxwell's equations. The selection of one of these known formulations to determine the sensitivity profile of the coil would yield predictable results to one skilled in the art at the time of the invention.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eggers et al in view of Jakob et al. Eggers et al disclose an MRI system that includes a coil array 6 and a controller configured to generate and update sensitivity maps based upon position data obtained from the coils. The coils include markers and the MRI system is used to detect the position of the coils and correct a reference sensitivity map based upon coil movement. The system can include a phantom 20 used to generate the reference maps. Eggers et al further discloses that the reference sensitivity maps can be provided using mathematical formulas. As disclosed in paragraph 0030, Eggers et al disclose that the position and orientation of the coils can be monitored at regular intervals. Therefore, the signals can be received in an interleaved manner. Jakob et al disclose that one type of formula used to measure the reference maps is Biot-Savart's law. The selection of any known formulation for deriving a reference sensitivity map would yield predictable results to one skilled in the art at the time of the invention.

Claims 17,18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eggers et al. Eggers et al disclose an MRI system that includes a coil array 6 and a controller configured to generate and update sensitivity maps based upon position data obtained from the coils. The coils include markers and the MRI system is used to detect the position of the coils and correct a reference sensitivity map based upon coil movement. The system can include a phantom 20 used to generate the reference maps. As disclosed in paragraph 0030, Eggers et al disclose that the position and orientation of the coils can be monitored at regular intervals. Therefore, the signals can be received in an interleaved manner. With respect to claim 17, Eggers et al disclose that MR imaging can be used to determine the position and orientation of the coil. It would have been obvious to one skilled in the art to have used any known method for determining position information of the coil. The substitution of one known method for determining position information for another using MR data would yield predictable

results to one skilled in the art at the time of the invention. With respect to claim 18, in the absence of any showing of criticality, the specific type of coil and marker used would have been an obvious design choice of known equivalents in the art.

### ***Response to Arguments***

Applicant's arguments filed January 28, 2008 have been fully considered but they are not persuasive. Applicant argues that Eggers et al disclose determination of the position and orientation of the coil takes place continuously during the MR data acquisition period. As disclosed in paragraph 0030, Eggers et al disclose that the position and orientation of the coils can be monitored at regular intervals. Therefore, the signals can be received in an interleaved manner.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ruth S. Smith whose telephone number is 571-272-4745. The examiner can normally be reached on M-F 7:30 AM-4:00 PM.

Art Unit: 3737

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ruth S. Smith/  
Primary Examiner, Art Unit 3737

RSS